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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/294,367	04/20/1999	TADASHI SAWAYAMA	35.C13470	6055

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15
EXAMINER

KACKAR, RAM N

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 06/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/294,367

Applicant(s)

SAWAYAMA ET AL.

Examiner

Ram N Kackar

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/23/2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-16, 18-21, 23-27, 35, 38 and 45-55 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

- 5) ☐ Claim(s) _____ is/are allowed.

- 6) ☒ Claim(s) 12-16, 18-21, 23-27, 35, 38 and 45-55 is/are rejected.

- 7) ☐ Claim(s) _____ is/are objected to.

- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 12, 23-27, 35 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitt et al (US Patent 6099649) in view of Ohta et al (US Patent 5209182).

Schmitt et al disclose a processing apparatus having a processing chamber for CVD (Fig 5-521), exhaust means (Fig 5-pump), chemical reaction means for the exhaust- hot trap (Fig 5-16) and resistance heating (Col 5 line 38) for the hot trap.

Schmitt et al do not expressly disclose the heater to be made of a filament and the temperature control of the processing space member.

Ohta et al disclose a CVD apparatus using a hot filament of tungsten going at least to 2100 degrees C (Col 6 line 53) and a precise temperature control (Col 4 line 3 -28).

Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to heat the trap of Schmitt et al with tungsten filament to get the high temperature needed for trapping the unused gas/by-products.

Regarding recovery means-cold trap being within 5 cm of the reaction means-hot trap, Schmitt recommends that (Col 6 line 1-6) the cold trap should be following hot trap and close to it.

Art Unit: 1763

Regarding claim 35, mean velocity depends upon pressure and is related to intended use and has no patentable significance.

3 Claims 13-14, 16 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitt et al (US Patent 6099649) in view of Smith et al (US Patent 5217545).

Schmitt et al disclose a processing apparatus having a processing chamber for CVD (Fig 5-521), exhaust means (Fig 5-pump) and chemical reaction means for the exhaust- hot trap (Fig 5-16).

Schmitt et al do not disclose the heater to be comprised of phosphorus or silicon.

Smith et al disclose a heater containing phosphorus and silicon with chromium and molybdenum, the ratio of silicon being more than 0.1% (Abstract).

Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to use the alloy of Smith for its excellent resistance to oxidation at elevated temperature.

Claims 16 and 21 are rejected as being directed to an intended use.

4 Claims 13, 15, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitt et al (US Patent 6099649) in view of Pollock et al (US Patent 4982068).

Schmitt et al disclose a processing apparatus having a processing chamber for CVD (Fig 5-521), exhaust means (Fig 5-pump) and chemical reaction means for the exhaust- hot trap (Fig 5-16).

Schmitt et al do not disclose the heater to be comprised of phosphorus or silicon.

Pollock et al disclose a heater containing phosphorus and silicon with phosphorus in relatively small amount (Col 8 lines 42-53, Example 1, Col 10 lines 37-39).

Art Unit: 1763

Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to use the material of Pollock for precise control of resistivity by the use of Phosphorus dopant.

5 Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitt et al (US Patent 6099649) in view of Moslehi et al (US Patent 5082542).

Schmitt et al disclose a processing apparatus having a processing chamber for CVD (Fig 5-521), exhaust means (Fig 5-pump) and chemical reaction means for the exhaust- hot trap (Fig 5-16).

Schmitt et al do not disclose the heater to be comprised of silicon.

Moslehi et al disclose a heater element containing silicon with tungsten, titanium or molybdenum, the ratio of silicon being more than 0.1% (Col 12 lines 44- 62).

Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to use silicon and other refractory materials for precise control of resistance and time to heat or cool.

6 Claims 45-46, 48-49, 51, 53 and 55 are rejected under 35 U.S.C. 102(e) as being unpatentable over Schmitt et al (US Patent 6099649) in view of Poor et al (US Patent 5211820).

Schmitt et al disclose a processing apparatus having a processing chamber for CVD (Fig 1-14 and Col 1 line 11), exhaust means (Fig 1-22), chemical reaction means for the exhaust- hot trap (Fig 1-16) and a recovery means- a cold trap also a wall surface of the exhaust path (Fig 5-501). In another embodiment Schmitt discloses cooling means provided on the side of the exhaust means (Fig 1-28) while cooling uses liquid as cooling medium (Col 7 line 16).

Art Unit: 1763

Schmitt et al do not disclose an O-Ring seal for cooling means, which also controls the temperature of the seal to prevent damage to the seal. Although not disclosed expressly, it would be obvious to have a seal when two devices are connected hermetically and O-Ring seals are very frequently used for that purpose. This would have been the case when the cold trap is connected after hot trap.

Poor et al disclose (Col 21 lines 45-54 and Fig 9) an O- Ring seal attached to a water jacket used for cooling the tube as well as the seal so as not to damage it at higher temperature.

Therefore it would have been obvious for one of ordinary skill in the art at the time invention was done to have seals of O-Ring because the cooling means would be able to protect them from adverse effect of high temperature.

Regarding claims 48-49 and 51 it is well known and used practice to insulate devices, which need to be controlled independently but are in physical proximity so as to have better control over temperature and conserve energy.

7 Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitt et al (US Patent 6099649) in view of Poor et al (US Patent 5211820) as applied to claim 45 and further in view of Keiichi Akagawa (JP Patent 62236129).

Schmitt et al disclose a processing apparatus having a processing chamber for CVD (Fig 5-521), exhaust means (Fig 5) and chemical reaction means for the exhaust- hot trap (Fig 5-16). Schmitt et al disclose liquid as cooling medium for cold trap but do not disclose it to be a gas.

Keiichi Akagawa discloses a refrigerant cooling. A refrigerant could be in a gaseous phase.

Art Unit: 1763

Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to use liquid or refrigerant gas for cooling of cold trap.

8 Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitt et al (US Patent 6099649) in view of Poor et al (US Patent 5211820) as applied to claim 45 and further in view of Ohta et al (US Patent 5209182).

Schmitt et al do not expressly disclose the heater to be made of a filament and the temperature control of the processing space member.

Ohta et al disclose a CVD apparatus using a hot filament of tungsten going at least to 2100 degrees C (Col 6 line 53) and a precise temperature control (Col 4 line 3 –28).

Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to heat the trap of Schmitt et al with tungsten filament to get the high temperature needed for trapping the unused gas/by-products.

9 Claims 52 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitt et al (US Patent 6099649) in view of Poor et al (US Patent 5211820) as applied to claim 45 and further in view of Kikuchi Yoshikazu (JP 63200820).

Schmitt et al disclose a processing apparatus having a processing chamber for CVD (Fig 5-521), exhaust means (Fig 5) and chemical reaction means for the exhaust- hot trap (Fig 5-16).

Schmitt et al do not disclose a catalyst acting on unreacted gas or by-product or that the non-reacted gas could be containing silicon.

Kikuchi Yoshikazu discloses a catalyst and silane gas as an unreacted gas (Abstract).

Art Unit: 1763

Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to use a catalyst in addition to heating to completely react the unreacted gases and by-products.

Response to Amendment

Applicant's arguments filed 4/23/2003 have been fully considered but they are not persuasive.

Applicant argues that Schmitt fails to teach or suggest use of a cooling means having an O-Ring vacuum seal so that the seal temperature is controlled to prevent seal damage.

Schmitt does not expressly disclose O-Ring seals but Poor et al disclose (Col 21 lines 45-54 and Fig 9) an O- Ring seal attached to a water jacket used for cooling the tube as well as the seal so as not to damage it at higher temperature

Applicant argues that Schmitt fails to teach or suggest recovery means-cold trap within 5 cm of the chemical reaction causing means.

Schmitt does suggest that (Col 6 line 1-6) the cold trap should be following hot trap and close to it.

Applicant argues that Schmitt fails to teach or suggest high melting metal filament in an exhaust gas filament path.

While Schmitt et al do not expressly suggest high melting point metal filament, Ohta et al disclose a CVD apparatus using a hot filament of tungsten going at least to 2100 degrees C (Col 6 line 53).

Art Unit: 1763

Applicant argues that Schmitt fails to teach or suggest the heat generating member comprising phosphorus atoms.

While Schmitt et al do not expressly suggest the heat-generating member to comprise Phosphorus, Smith et al disclose a corrosion resistant sheathing of heat generating member comprising Phosphorus.

Applicant argues that employing filament for thermal CVD as in Ohta et al fails to teach or suggest a high melting point filament in an exhaust gas flow path.

Ohta et al disclose a tungsten filament in gas flow path for depositing film on a nearby substrate. This action is same as tungsten filament causing un reacted gas from exhaust gas path to react and deposit on the walls or other close by surfaces.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 4513298.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N Kackar whose telephone number is 703 305 3996. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703 308 1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9310 for regular communications and 703 872 9311 for After Final communications.

Art Unit: 1763

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0661.

RK

May 29, 2003


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700